SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY: PUTTUR-517 583
(AUTONOMOUS)
Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (DESCRIPTIVE)

Subject with Code: **Fundamentals of Machine Learning(20CS1103)**   Course & Branch: **B.Tech – CAD&CCC**

Regulation: **R20**   Year &Sem: **III-B.Tech & II - Sem**

UNIT –I
INTRODUCTION

1	a)	What is Machine learning? Explain the need of it.	**[L1][CO1]**	**[4M]**
	b)	List out applications and algorithms used in Machine Learning. Explain it?	**[L1][CO1]**	**[8M]**
2		Explain the various types of Machine Learning techniques with neat diagrams.	**[L2][CO1]**	**[12M]**
3	a)	Differentiate Machine Learning and Artificial Intelligence.	**[L4][CO5]**	**[6M]**
	b)	Describe classification techniques in supervised learning with an examples.	**[L1][CO1]**	**[6M]**
4	a)	List out various Unsupervised learning techniques used in Machine Learning.	**[L1][CO5]**	**[4M]**
	b)	Analyze the clustering techniques with examples.	**[L4][CO2]**	**[8M]**
5		Summarize the Guidelines for Machine Learning Experiments.	**[L2][CO1]**	**[12M]**
6	a)	Explain Model Selection in Machine learning.	**[L2][CO1]**	**[6M]**
	b)	Describe Generalization process in machine learning.	**[L1][CO1]**	**[6M]**
7	a)	Compare Supervised learning and Unsupervised learning	**[L5][CO1]**	**[6M]**
	b)	Analyze Reinforcement Learning with neat diagram..	**[L4][CO1]**	**[6M]**
8		Discuss clustering and association rules in unsupervised learning.	**[L2][CO2]**	**[12M]**
9		Analyze the classification and regression techniques in supervised learning.	**[L4][CO1]**	**[12M]**
10	a)	Establish the Association rules in unsupervised learning.	**[L3][CO2]**	**[6M]**
	b)	Analyze the real world applications of ML.	**[L4][CO6]**	**[6M]**

UNIT-II

SUPERVISED LEARNING

1	a)	Differentiate Supervised Learning and Unsupervised Learning	[L4][CO5]	[5M]
	b)	Explain Decision Tree Classification technique with an example.	[L2][CO6]	[7M]
2	a)	Describe classification techniques in supervised learning.	[L1][CO1]	[8M]
	b)	List out various Regression techniques in Machine Learning.	[L1][CO1]	[4M]
3	a)	Compare Univariate and Multivariate Decision Trees.	[L5][CO1]	[6M]
	b)	Explain about Pruning in supervised learning.	[L2][CO1]	[6M]
4	a)	Differentiate various Parametric and Non-Parametric Methods.	[L4][CO1]	[6M]
	b)	Analyze Bayesian Decision theory in supervised learning.	[L4][CO1]	[6M]

5	Summarize the following models.
	  (i) Linear regression
	  (ii) Logistic regression
			[L2][CO1]	[12M]

6	a)	Organize how to Tackle Over fitting and Under fitting.	[L4][CO3]	[6M]
	b)	Explain logistic regression in machine learning.	[L2][CO1]	[6M]
7	a)	Illustrate Multi-Layer Perceptron with neat architecture.	[L3][CO3]	[6M]
	b)	Analyze Regression discrimination in machine learning.	[L4][CO1]	[6M]
8	Discuss Back Propagation Algorithm with an example.		[L2][CO3]	[12M]
9	Analyze Maximum Likelihood Estimation in supervised learning .		[L4][CO3]	[12M]
10	a)	Express the Evaluation of Estimator bias and variance.	[L2][CO3]	[6M]
	b)	Illustrate Gradient Descent algorithm and its variants.	[L3][CO3]	[6M]

UNIT –III

UNSUPERVISED LEARNING

1		Discuss the following terms in unsupervised learning i. Association rules ii . Clustering	[L2][CO5]	[12M]
2	a)	Explain the various Clustering algorithms.	[L2][CO2]	[8M]
	b)	List out the various applications of clustering.	[L1][CO6]	[4M]
3	a)	Illustrate the mixtures of latent variable models with suitable example.	[L3][CO3]	[6M]
	b)	How mixture density is calculated in unsupervised learning?	[L2][CO2]	[6M]
4	a)	Analyze the working principle of K-means Clustering.	[L4][CO2]	[7M]
	b)	Give the different types of Partitioned algorithms used in clustering.	[L2][CO2]	[5M]
5	a)	List out the various types of Cluster methods in unsupervised learning.	[L1][CO6]	[8M]
	b)	Infer the similarities and differences between average-link clustering and k-means?	[L2][CO5]	[4M]
6	a)	Generalize K-Means Clustering algorithm in Unsupervised Learning.	[L6][CO2]	[6M]
	b)	Estimate the problems associated with clustering large data.	[L4][CO6]	[6M]
7		Describe the various types of Hierarchal Clustering techniques.	[L1][CO3]	[12M]
8	a)	Analyze the Expectation-Maximization algorithm with simple Example.	[L4][CO3]	[6M]
	b)	Explain about Gaussian Mixture Models.	[L2][CO3]	[6M]
9	a)	Demonstrate linkage methods in Hierarchical Clustering .	[L2][CO3]	[6M]
	b)	How can we measure the distance between two clusters?	[L2][CO3]	[6M]
10		Summarize the following terms briefly i.K-means Clustering ii. Hierarchal Clustering	[L2][CO5]	[12M]

UNIT-IV
NON PARAMETRIC METHODS
&
DIMENTIONALITY REDUCTION

1	a)	Define and Explain about Non parametric Methods.	[L1][CO3]	[6M]
	b)	List out Advantages and limitations of Non parametric methods in ML.	[L1][CO3]	[6M]
2		State and explain various Non-Parametric Density Estimation techniques	[L1][CO3]	[12M]
3	a)	Analyze the K-Nearest Neighbor Algorithm with simple example.	[L4][CO6]	[6M]
	b)	Express the Non Parametric classification Techniques.	[L2][CO3]	[6M]
4	a)	Illustrate Condensed Nearest Neighbor (CNN).	[L3][CO4]	[6M]
	b)	Differentiate Exploratory and Confirmatory factor analysis.	[L4][CO4]	[6M]
5	a)	List out the Applications of PCA in machine learning.	[L1][CO6]	[6M]
	b)	Distinguish between parametric and non-parametric classifications.	[L4][CO5]	[6M]
6	a)	Discuss the Principle Component Analysis.	[L2][CO5]	[6M]
	b)	Describe the Factor Analysis Technique.	[L1][CO5]	[6M]
7		List out and explain the various dimensionality reduction techniques.	[L1][CO3]	[12M]
8	a)	Explain Linear Discriminant Analysis.	[L2][CO4]	[8M]
	b)	Outline the various applications of Linear Discriminant Analysis.	[L2][CO6]	[4M]
9	a)	Compare Multidimensionality scaling and Metric dimensionality scaling.	[L5][CO5]	[6M]
	b)	List out the applications of MDS.	[L1][CO6]	[6M]
10	a)	Differentiate Feature selection and Feature Extraction.	[L4][CO3]	[6M]
	b)	Explain about Subset Selection Techniques.	[L2][CO4]	[6M]

UNIT –V

REINFORCEMENT LEARNING

1	a)	Define and explain about the Reinforcement learning.	[L1][CO4]	[6M]
	b)	Compare unsupervised learning and Reinforcement learning.	[L5][CO5]	[6M]
2	a)	Explain various types of reinforcement learning techniques.	[L2][CO4]	[6M]
	b)	List out the advantages and disadvantages of Reinforcement Learning.	[L1][CO1]	[6M]
3	a)	List the applications of Reinforcement Learning and explain it.	[L1][CO6]	[6M]
	b)	Differentiate the Reinforcement learning and Supervised learning.	[L4][CO5]	[6M]
4		Analyze the working process of Reinforcement learning.	[L4][CO3]	[12M]
5	a)	Explain in detail about Single State Case: K-Armed Bandit problem	[L2][CO4]	[6M]
	b)	What are the Elements involved in Reinforcement Learning using Markov Decision Process (MDP)?	[L1][CO4]	[6M]
6	a)	Explain Model-Based Learning with an example.	[L2][CO4]	[6M]
	b)	Distinguish between model based learning and temporal difference learning.	[L2][CO5]	[6M]
7	a)	Illustrate in detail about K-Armed Bandit in reinforcement learning.	[L3][CO4]	[6M]
	b)	Describe Exploration and Exploitation strategies in temporal difference learning.	[L1][CO4]	[6M]
8	a)	Describe various parameters used in Temporal Difference Learning.	[L1][CO4]	[6M]
	b)	List out the advantages, disadvantages of Temporal difference learning.	[L1][CO5]	[6M]
9	a)	Explain the Nonparametric rewards and actions in temporal difference learning.	[L2][CO5]	[6M]
	b)	Assess in detail about partially observables states in Reinforcement learning.	[L5][CO5]	[6M]
10	a)	Explain Generalization process in Model Based Learning.	[L2][CO5]	[6M]
	b)	Differentiate between Model based learning and Model free learning	[L4][CO4]	[6M]

Prepared by: S.Maabuni